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positioning the polarization medium in line with the light beam of the light source so that the third polarization state of the polarization medium selects and attenuates each of the at least two polarization states equally or substantially equally.

Remarks

The preceding amendments and following remarks are submitted in response to the Official Action of the Examiner mailed September 24, 2002. Claims 1-22 remain pending in the application, and claims 1, 15, 21 and 22 have been amended. Entry of this amendment and reconsideration by the Examiner to that end is respectfully requested.

In paragraph 6 of the Office Action, the Examiner rejected claims 1-14 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Regarding claim 1, the Examiner states that the phrases "a light output that has one and/or both of at least two polarization states" renders the claim indefinite because it is unclear how the single light output can have at least two polarization states. After careful review, Applicants must respectfully disagree. It is well known in the art that a single light output can have multiple polarization states. For example, the present specification states:

> As typically constructed, VCSELs can readily switch polarization states ***and frequently emit light simultaneously from multiple polarization states***. This phenomenon presents some problems and challenges for system designers using VCSELs in their applications. Controlling polarization of the optical signal is important for many sensor applications.
>
> Inconsistent power output and switching noise are common examples of types of problems resulting from uncontrolled VCSEL polarization. Consider, for example, an optoelectronic system that utilizes polarization selective components concentrating on only one of a VCSEL's two polarizations. If the VCSEL is emitting exclusively from that one polarization, then the system receives 100% of

> the VCSEL power. If, however, the VCSEL is emitting exclusively from the other polarization, then the system receives none of the VCSEL power. If the VCSEL is switching between, ***or emitting simultaneously from, the two polarizations, then the system will receive intermittent, or partial, power respectively***. Also consider, for example, a data communications system that performs high-speed switching. Oscillation between the VCSEL polarizations results in switching noise that can impact system performance and reliability. In systems where the power and noise effects of VCSEL polarization combine, extensive noise and related system problems result.

(Emphasis Added) (Specification, page 2, line 25 through page 3, line 16). In view thereof, Applicants believe that the phrases "a light output that has one and/or both of at least two polarization states" is definite and fully complies with § 112, second paragraph.

In the same paragraph, the Examiner states that the phrase "a polarization medium positioned in proximal relation to the laser source element for selecting and attenuating' is vague and indefinite. The Examiner states that it is not clear how the polarization medium is used to select and attenuate. The Examiner further states that the claim recites a polarization controlled optional energy source without the recitation of any structure elements for polarization control.

Again, Applicants must respectfully disagree. The present specification discloses a polarization medium that may be used in conjunction with a laser source element to select and attenuate each of the at least two polarization states of the laser source element equally or substantially equally. For example, the present specification states:

> Referring now to FIG. 4, several alternatives for providing a polarization member in accordance with the present invention are illustrated in reference to cross sectional view of cover 304. FIG. 4(a) depicts ***a polarization element 400*** disposed within window 314 of cover 304. ***Element 400 comprises a plate or sheet polarizer, made of glass, plastic, or other suitable medium. Element 400 is formed into the shape of, and disposed within, window 314 such that its polarization direction aligns with axis 320.*** Element 400 can be secured or formed within cover 304, by encapsulation, adhesive, or crimping, for example. As illustrated in FIG. 4(b), a

> polarization element 402 can alternatively be incorporated within cover 304 disposed within other optical elements 404 (e.g. lenses, filters). FIG. 4(c) depicts another alternative wherein ***polarization element 406*** is disposed on top of surface 310 covering window 314. Element 406 can be affixed to cover 304 by an adhesive, epoxy, or other suitable application medium.
>
> Typically, the polarization medium will be selected based on the wavelength of the laser source used. ***Polarization elements can be formed by a number of methods, depending on particular design constraints and desired performance characteristics. Examples include die-cutting a desired polarization material, using a polymer-based polarizer disposed upon some other optical element, and using an etched diffraction element or a formed film-type holographic element.*** All such media can be used to form a linear polarization element in accordance with the teachings of the present invention.
>
> Alternatively, a polarization element can be internal, but unattached, to cover 304, disposed between VCSEL 308 and window 314. For example, a polarization element can comprise a self-adhesive sheet that can be readily be disposed upon and removed from the upper surface of VCSEL 308, much like a decal. A polarization element can also comprise a pane-like structure positioned above the upper surface of VCSEL 308 and supportively affixed to either sensing element 306 or base 302. In other embodiments, a polarization element according to the present invention can be associated with VCSEL 308 entirely external to and independent from component 300, merely placed in the optical emission path thereof to ensure linear polarization in accordance with the teachings of the present invention.

(Emphasis Added)(Specification, page 11, line 11 through page 12, line 16). The present invention further states:

> In one embodiment of the present invention, a polarization controlled optical energy source comprises a laser source element having an inherent polarization characteristic; and ***a polarization medium positioned in proximal relation to the laser source element and adapted to select and attenuate the polarization characteristic equally.***

(Emphasis Added)(Specification, page 5, lines 4-8). With reference to the illustrative embodiment of Figure 2(b), the present specification also states:

> Thus, emission of VCSEL 200 will be polarized along the crystalline plane

> directions 204 (parallel to the cleavage planes), (011) and (011'), as depicted in FIG. 2(b). Proper orientation 206 of a linear polarizer will equally select and attenuate each polarization. For this example, orientation 206 should be at about 45 degrees to both directions 204, which is parallel to the (001) or (010) crystal planes.

(Specification, page 9, lines 10-15). As the Examiner may well be aware, the essential inquiry pertaining to the definiteness of claim language is whether the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity. In addition, the definiteness of claim language must be analyzed, not in a vacuum, but in light of: (A) The content of the particular application disclosure; (B) The teachings of the prior art; and (C) The claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made (see MPEP § 2173.02). As can be seen from the foregoing, the present specification clearly supports the phrase "a polarization medium positioned in proximal relation to the laser source element for selecting and attenuating", and further teaches how the polarization medium may be configured to select and attenuate each of the at least two polarization states provided by the laser source element equally or substantially equally, as claimed. As such, when read in light of the present specification, claim 1 clearly sets out and circumscribes the subject matter with a reasonable degree of clarity and particularity, as required by 35 U.S.C. § 112, second paragraph.

Applicants fear that the Examiner is equating claim breadth with indefiniteness. However, as noted in *In re Miller*, 441 F.2d 689, 169 USPQ 597 (CCPA 1971), claim breadth is not to be equated with indefiniteness. If the scope of the subject matter embraced by the claims is clear, and if applicants have not otherwise indicated that they intend the invention to be of a

scope different from that defined in the claims, then the claims comply with 35 U.S.C. 112, second paragraph. (see MPEP § 2173.04). In the present case, claim 1 is broad. However, claim 1 recites specific structure including a laser source element and polarization medium, wherein the polarization medium is positioned in proximal relation to the laser source element so as to select and attenuate each of the at least two polarization states equally or substantially equally. Applicants therefore believe that claim 1, and dependent claims 2-14, fully comply with 35 U.S.C. 112, paragraph 2.

In paragraph 8 of the Office Action, the Examiner rejected claims 1, 2, 4-7, 10-12, 15-19 under 35 U.S.C. §102(e) as being anticipated by Davis et al. (U.S. Patent No. 6,069,905). Although Applicants respectfully disagree with this rejection, claim 1 has been amended to further clarify the invention. Claim 1, as amended, recites:

> 1. (Amended) A polarization controlled optical energy source comprising:
>
> a laser source element that produces a light output that has one and/or both of at least two polarization states; and
>
> a polarization medium positioned in proximal relation to the laser source element for <u>polarizing the light output in a third polarization state that</u> [selecting and attenuating] <u>selects and attenuates</u> each of the at least two polarization states equally or substantially equally.

As can be seen, nothing on Davis et al. appears to suggest a polarization medium positioned in proximal relation to the laser source element for <u>polarizing the light output in a third polarization state that selects and attenuates each of the at least two polarization states equally or substantially equally</u>. Instead, Davis et al. appear to minimize any polarization effects on the reflected and transmitted light. For example, Davis et al. state: "[t]he tilted window has a metallic coating for

partial reflection and for minimizing polarization effects on reflected and transmitted light." Davis et al., Abstract. Further, "[a]t the same time, the lateral extent of the thick dielectric must be minimized, because the optical transmission of such a thick coating will exhibit significant polarization selectivity." (Davis et al., column 3, lines 6-9). And, "[a]ny tilted reflector results in some polarization sensitivity; however, an appropriate thickness and proper choice of materials of the metallic coating on window 37 minimizes the polarization effects." (Davis et al., column 4, line 67 through column 5, line 3). In view of the foregoing, Applicants believe that claims 1, 2, 4-7, and 10-12, are clearly patentable over Davis et al. Independent claims 15, 21 and 22 have been amended to include a similar limitation to claim 1. As such, claim 15-19, and 21-22 are also believed to be clearly patentable over Davis et al.

In paragraph 10 of the Office Action, the Examiner appears to have rejected claims 3, 8, 9, 13, 14, 20 and 22 under 35 U.S.C. §103(a) as being unpatentable over Davis et al. in view of Jewell et al. (U.S. Patent No. 5,331,654). After careful review, Applicants believe that this rejection is improper because Davis et al. is disqualified as prior art under 35 U.S.C. §103.

Davis et al. was filed on December 31, 1997, and issued on May 30, 2000. The present application was filed on May 23, 2000. As such, Davis et al. would only qualify as prior art under 35 U.S.C. §102(e). In view thereof, the Examiner's rejection of claims 3, 8, 9, 13, 14, 20 and 22 must have been made under 35 U.S.C. §102(e)/103. However, 35 U.S.C. § 103(c) states:

> *35 U.S.C. 103. Conditions for patentability; non-obvious subject matter.*
>
> *****
>
> (c) Subject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of section 102 of this title, shall

> not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

35 U.S.C. 103(c) applies to all utility, design and plant patent applications filed on or after November 29, 1999, which includes the present application. The subject matter of Davis et al. and the subject matter of the present application were, at the time the invention was made, owned by or subject to an obligation of assignment to a common assignee, namely, Honeywell International Inc., of Morristown, New Jersey, U.S.A. In view of the foregoing, Davis et al. is disqualified as prior art under 35 U.S.C. §103(c), and claims 3, 8, 9, 13, 14, 20 and 22 are all believed to be in condition for allowance.

Having thus addressed the Examiner's grounds for rejections, Applicants believe pending claims 1-22 are clearly in condition for allowance. Reconsideration to that end is respectfully requested. If a telephone conference might be of assistance, please contact the undersigned attorney at 612-677-9050.

Respectfully submitted,

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By their attorney,

Date December 18, 2002

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Version with Markings to Show Changes Made

In the Claims

Claims 1, 15, 21 and 22 have been amended as follows:

1. (Amended) A polarization controlled optical energy source comprising:

a laser source element that produces a light output that has one and/or both of at least two polarization states; and

a polarization medium positioned in proximal relation to the laser source element for polarizing the light output in a third polarization state that [selecting and attenuating] selects and attenuates each of the at least two polarization states equally or substantially equally.

15. (Amended) A method for VCSEL polarization control comprising the steps of:

providing a VCSEL element that produces a light output that has one and/or both of at least two polarization states;

providing a polarization medium that polarizes the light output in a third polarization state; and

positioning the polarization medium in proximal relation to the VCSEL element so that the third polarization state [to] selects and attenuates each of the at least two polarization states equally or substantially equally

21. (Amended) A polarization controlled optical energy source comprising:

a laser source element for producing a light output that has one and/or both of at least two

polarization states; and

polarization means for polarizing the light output in a third polarization state that [selecting and attenuating] selects and attenuates each of the at least two polarization states equally or substantially equally.

22. (Amended) A method for providing a relatively constant light intensity output from a light source that produces a light beam that has at least two polarization states, the method comprising the steps of:

providing a polarization medium that polarizes the light beam in a third polarization state; and

positioning the polarization medium in line with the light beam of the light source so that the third polarization state of the [linear] polarization medium selects and attenuates each of the at least two polarization states equally or substantially equally.